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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 09/498,703 | 02/07/2000 | Jahja I. Trisnadi | SLM-04300 | 9200 |

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| EXAMINER | |
|---|---|
| RODRIGUEZ, ARMANDO | |
| **ART UNIT** | **PAPER NUMBER** |
| 2828 | |

DATE MAILED: 11/04/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 09/498,703 | TRISNADI, JAHJA I. | |
| | Examiner | Art Unit | |
| | ARMANDO RODRIGUEZ | 2828 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *12 August 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1,19-49 and 59-63* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *1,19-49 and 63* is/are allowed.

6)☒ Claim(s) *59-62* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

## DETAILED ACTION

### *Response to Amendment*

Claims 1,19-49 and 59-63 are pending.

Claims 2-18,50-58 and 64-68 have been canceled.

The 35 USC 103 rejection of claims 50-58 has been withdrawn based on applicant's amendment filed on August 12, 2004.

### *Allowable Subject Matter*

The indicated allowability of claims 59 and 60 is withdrawn in view of the newly discovered reference(s) to Glenn et al. Rejections based on the newly cited reference(s) follow.

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 59,60 and 62 are rejected under 35 U.S.C. 103(a) as being unpatentable over Glenn et al (Proceedings of SPIE, Efficient Liquid Crystal Light Valves) in view of De Vaan (PN 5,486,884).

Regarding claims 59,62

Glenn et al discloses in the abstract a liquid crystal light valve [applicant's means for rotating], which provides rotation of the polarization by modulation of the liquid crystal valve. Glenn et al further discloses reducing laser speckle, when a laser source

is used. Glenn et al describes using the liquid crystal in a projector, which implies the use of screen.

Glenn et al does not explicitly disclose a depolarization screen.

De Vaan discloses combining a cholesteric filter (13) with a depolarizing layer (15) to form an image projection screen (1) [applicant's depolarization screen], which receives an image from projector (19).

Therefore, it would have been obvious to a person of ordinary skill in art at the time of the invention to provide the projector of Glenn et al with the image projection screen of De Vaan because it the screen will reduce contrast due to ambient light (column 1 lines 64-67).

Regarding claim 60,

The liquid crystal valve of Glenn et al is an electro-optic polarization rotator.

Claim 61 is rejected under 35 U.S.C. 103(a) as being unpatentable over Glenn et al as applied to claim 59 above, and further in view of Asano (JP 404175607A).

Regarding claim 61,

Glenn et al disclose s reducing speckle by rotation of the polarization but does not disclose the use of half wave plate mechanically rotated.

However, the use of half wave plate being mechanically rotated for rotating the polarization of a light beam is well-known in the art, as evident by Asano and described in the abstract, where a half wave plate (30) is driven with a motor (37) to rotate its polarization.

***Allowable Subject Matter***

Claims 1,19-49 and 63 are allowed.

The following is an examiner's statement of reasons for allowance:

Regarding claim 1,

None of the cited prior arts alone or in combination discloses the claimed invention having the structural combination for reducing laser speckle as recited in independent claim 1, where a polarizing beam splitter configured to divide a first polarized laser output into a second polarized laser output and third polarized laser output, the first polarized laser output having a coherence length; a light guide comprising a polarization preserving fiber optic, the light guide configured to create an optical path difference between the second polarized laser output and the third polarized laser output, the optical path difference being at least about the coherence length, the light guide being configured to direct the second polarized laser output to the polarizing beam splitter such that the polarizing beam splitter combines the second polarized laser output and the third polarized laser output into a fourth laser output and a depolarizing screen coupled to the fourth laser output, the fourth laser output illuminating the depolarizing screen.

Regarding claims 19-33,

None of the cited prior arts alone or in combination discloses the claimed invention having the structural combination for reducing laser speckle as recited in independent claim 19, where a polarizing beam splitter configured to divide a first polarized laser output into a second polarized laser output and third polarized laser output; a plurality of mirrors configured to create an optical path difference between the

second polarized laser output and the third polarized laser output, the plurality of mirrors configured to direct the second polarized laser output to the polarizing beam splitter such that the polarizing beam splitter combines the second polarized laser output and the third polarized laser output into a fourth laser output; a piezoelectric transducer coupled to at least one of the mirrors, the piezoelectric transducer being driven by an electrical signal such that the optical path difference is varied by an amplitude, the amplitude being at least about a half wavelength of the polarized laser output, the electrical signal having an electrical signal frequency and a depolarizing screen coupled to the fourth laser output, the fourth laser output illuminating the depolarizing screen, the electrical signal frequency being at least a sufficient frequency such that laser speckle is reduced.

Regarding claims 34-40,

None of the cited prior arts alone or in combination discloses the claimed invention having the structural combination for reducing laser speckle as recited in independent claim 34, having means for dividing a first polarized laser output into a second polarized laser output and third polarized laser output; the first polarized laser output having a coherence length; the second laser output and the third laser output having orthogonal polarizations and having intensities that are about equal; means for oscillating an optical path length of the second polarized laser output by an amplitude and with an oscillation frequency, the amplitude being at least about a half wavelength of the first polarized laser output; means for combining the second polarized laser output and the third polarized laser output into a fourth laser output and a depolarization

screen coupled to the fourth laser output, the fourth laser output illuminating the depolarizing screen, the oscillation frequency being at least a sufficient frequency such that laser speckle is reduced.

Regarding claims 41-43,

None of the cited prior arts alone or in combination discloses the claimed invention having the method steps for reducing laser speckle with the steps for dividing a first polarized laser output into a second polarized laser output and third polarized laser output, the second laser output and the third laser output having orthogonal polarizations and having intensities that are about equal, oscillating an optical path length of the second polarized laser output by an amplitude and with an oscillation frequency, the amplitude being at least about a half wavelength of the first polarized laser output, combining the second polarized laser output and the third polarized laser output into a fourth laser output and illuminating a depolarizing screen, the oscillation frequency being at least a sufficient frequency such that laser speckle is reduced.

Regarding claims 44-46,

None of the cited prior arts alone or in combination discloses the claimed invention having the structural combination for reducing laser speckle as recited in independent claim 44, having means for dividing a first polarized laser output into a second polarized laser output and third polarized laser output; the second laser output and the third laser output having orthogonal polarizations and having intensities that are about equal; means for switching between the a first optical path length and a second optical path length for the second polarized laser output, a difference between the first

optical path length and the second optical path length being about an odd multiple of a half wavelength of the first polarized laser output; means for combining the second polarized laser output and the third polarized laser output into a fourth laser output, means for diverging the fourth laser output in a first direction to create a fifth laser output, a scanning mirror coupled to the fifth laser output, the scanning mirror reflecting the fifth laser output to create a line illumination, and a depolarizing screen illuminated by the line illumination, the scanning mirror repeatedly scanning the line illumination across a portion of the depolarizing screen such that the means for switching maintains the first optical path length for a first scan, switches to the second optical path length for a second scan, and alternates between the first optical path length and the second optical path length for subsequent scans.

Regarding claims 47-49,

None of the cited prior arts alone or in combination discloses the claimed invention having the method steps for reducing laser speckle with the steps for dividing a first polarized laser output into a second polarized laser output and third polarized laser output; the second laser output and the third laser output having orthogonal polarizations and having intensities that are about equal; switching between the a first optical path length and a second optical path length for the second polarized laser output, a difference between the first optical path length and the second optical path length being about an odd multiple of a half wavelength of the first polarized laser output; combining the second polarized laser output and the third polarized laser output into a fourth laser output; diverging the fourth laser output in a first direction; scanning

the fourth laser output in a second direction across a portion of a depolarizing screen in a first scan with the first optical path length, in a second scan with the second optical path length, and in subsequent scans alternating between the first optical path length and the second optical path length, the second direction being orthogonal to the first direction.

Regarding claim 62,

None of the cited prior arts alone or in combination discloses the claimed invention having the method steps for rotating a polarization of a laser output, whereby a rotating polarization is formed, the rotating polarization being driven with a rotation frequency and illuminating a depolarization screen coupled to the laser output, the rotation frequency being sufficient to reduce laser speckle.

Regarding claim 63,

None of the cited prior arts alone or in combination discloses the claimed invention having the structural combination for reducing laser speckle as recited in independent claim 63, having means for dividing a first polarized laser output into a second polarized laser output and third polarized laser output, the means for dividing comprising a polarizing beam splitter, the first polarized laser output having a coherence length, the second polarized laser output and the third polarized laser output having orthogonal polarizations and having intensities that are about equal; a light guide comprising a polarization preserving fiber optic, the light guide coupled to the second polarized laser output, the light guide creating an optical path difference between the second polarized laser output and the third polarized laser output, the optical path

difference being at least about the coherence length; means for combining the second polarized laser output and the third polarized laser output into a fourth laser output, the means for combining comprising the polarized beam splitter and a depolarizing screen coupled to the fourth laser output.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ARMANDO RODRIGUEZ whose telephone number is 571-272-1952. The examiner can normally be reached on 9:00 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, MINSUN HARVEY can be reached on 571-272-1835. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

ARMANDO RODRIGUEZ
Examiner
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SUPERVISOR
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AR/MH